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# The landscape of agricultural terraces in mountainous areas in the region of valencia (eastern spain)<sup>(\*)</sup>. The construction and decline of a cultural heritage

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## ملخص

أصبح مشهد المدرجات الزراعية أحد العناصر التراثية الأكثر تعريفا لهوية العالم الريفي المتوسطي. وبالرغم من ذلك فإن الأبحاث في هذا المجال مازالت محدودة بفعل صعوبة التأريخ لهذه البنيات، والتي يمكن نعتها باللازمية. وهي خاصية تعطي إمكانات تنوع التحليل، من وجهة النظر الجغرافية المندمجة يمكن ربط المتغيرات الاجتماعية والبيئية بتشكيل هذه المشاهد وبانقراضها. اعتمادا على دراسة جبال بلنسية سنقوم بتحليل هذه التحولات في إطار تطور المجتمعات الريفية التي عملت على بنائها وتغييرها منذ العصر الوسيط وإلى الوقت المعاصر. بلغت هذه التحولات أوجها في القرن XIX وتسارعت وتيرتها في القرن XX. يهدف هذا البحث المساهمة في التعرف على تشكل وتحول المشاهد المهيكلية بواسطة المدرجات الزراعية إلى يومنا هذا. وفي الأخير، سنشير إلى تطورها الراهن من زاوية اجتماعية وإمكانات المحافظة عليها في سياق تطبعه التحولات الاقتصادية التي طرأت على المجالات الريفية المتواجدة بالمناطق السياحية الأكثر أهمية بحوض البحر الأبيض المتوسط.

**كلمات مفتاحية:** مشهد المدرجات الزراعية، جبال بلنسية، تشكل وتحول المشاهد

## Résumé

Le paysage des terrasses de culture est devenu un des éléments patrimoniaux et identitaire du monde rural méditerranéen. Malgré cela, les recherches sont encore réduites vu la difficulté d'établir avec précision la date de ces structures, lesquelles ont un caractère qu'on peut qualifier d'atemporel. L'importance de ces terrasses dans le paysage diversifie les éventuelles perspectives d'analyse. D'un point de vue géographique, de type intégral, on peut aussi mettre en rapport les variables sociales et environnementales dans leur formation et aussi dans leur disparition. Dans une recherche appliquée aux montagnes de

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Valence, nous analyserons ces transformations dans le cadre de l'évolution des sociétés rurales qui, au Moyen Âge et avec les mutations agricoles et sociales contemporaines, les ont utilisées et transformées. Ces constructions, qui atteignent leur splendeur dans le XIX<sup>e</sup> siècle, ont connu une évolution très rapide dans le XX<sup>e</sup> siècle. La présente recherche a pour objectif la contribution à la connaissance sur la formation et la dynamique des paysages structurés par des terrasses jusqu'à présent. Finalement, nous signalerons son évolution actuelle d'un point de vue social, ses potentialités et les possibilités de conservation dans un contexte défavorable marqué par les changements économiques dans les espaces ruraux dans une des régions les plus touristiques de la Méditerranée.

**Mots clés:** paysages des terrasses de culture, montagnes de Valence, formation et dynamique des paysages.

### **Abstract**

The terraced fields of farming land have become one of the heritage assets with greater identification in the Mediterranean rural area. Despite this, it must be noted that research is still reduced mainly by the difficulty of tracing back the exact date of creating these structures whose characteristics are described as being timeless. Their importance in the landscape diversifies the possible analytical perspectives; but from a typically integral geographic standpoint, the contribution of social and environmental variables can be set against their formation as well as their disappearance in relation with abandonment of traditional activities in rural areas. In an applied research study on the mountains of Valencia, the transformations of these fields are analyzed as part of the development of rural societies which have used and transformed them in the Middle Ages and as a result of contemporary agricultural and social changes. These constructions, which reached their splendor in the nineteenth century, experienced a rapid evolution in the twentieth century. This research aims to contribute to understanding the formation and dynamic landscapes structured by terraces so far. Finally, their current assessment from a social point of view and their potentialities and opportunities for conservation in an unfavorable context marked by economic changes brought to rural areas located in one of the most touristic places of the Mediterranean are indicated.

**Key words:** landscape of agricultural terraces, mountainous of Valencia, formation and dynamic landscapes.

## **1. Introduction**

The landscape formed by agricultural terraces has become one of the most characteristic elements of rural areas in the Mediterranean region. Nevertheless, the importance of these landscapes has not been reflected in studies carried out in scientific fields, including geography, which have been unable to define methodologies for their general analysis nor overviews of these agricultural structures. In addition, measures in place to protect and conserve these terraces have not been adapted to their abandonment as farming areas, which has taken place at a rapid, intense pace over the last few decades. The importance of agricultural terraces in the landscape means that they can be examined from a variety of different analytical perspectives (archaeology, history, ecology, edaphology, ethnology, architecture), and this leads to transdisciplinarity (Palet & Riera 2000; Blondel 2006). A comprehensive geographical perspective allows us to relate socioeconomic and environmental variables to the construction and subsequent disappearance of these terraces, which is linked to the abandonment of traditional rural activities in Mediterranean Europe.



## **2. The terraced landscape: cultural heritage and ecological importance**

By using the term “terraced landscape”, we can integrate many of the different analytical perspectives mentioned above. This landscape is a piece of heritage which must be understood in the socioeconomic context in which it was created, and which reflects the cultural practices of ecological management in the area, practices which have had varying degrees of efficiency. In addition to their cultural importance, these terraced landscapes are also exceptionally significant in environmental terms, as they help to prevent erosion and facilitate infiltration and soil development. This useful feature of terraces, one of the main reasons they were built in the first place, can still be seen today in many abandoned crop terraces. Indeed, the social and economic changes which have taken place in rural areas in Europe, and the difficulties involved in mechanising agricultural practices on steep slopes through the use of modern farming techniques, have led to the abandonment of thousands of hectares of agricultural terraces. Much of this land is still used to grow crops on a part-time basis, to make an extra economic contribution to household income or simply out of habit or an attachment to the land (Moltó 2003). However, the dominant trend, and one which is constantly on the increase, is that of abandonment. The response and subsequent development of abandoned terraces, which sometimes involves a radical change in land use, is a matter which goes beyond the field of mere cultural heritage. We are gradually learning more and more about how abandoned terraces behave in relation to two variables: erosion and plant regeneration (Cerdeira 1997; Padilla 1998; Asins-Vela 2007).

Studies show that these abandoned terraces undergo a period of positive regeneration in the medium term, starting with the land around the edges (neglected lands), if other unsuitable human practices (intensive livestock farming, reforestation, forest fires) do not interfere in the process. In such a case, soil layers may disappear and soil may generally be degraded, with serious consequences. The management of abandoned land, especially in areas with higher aridity levels and less fertile soils, is of fundamental importance (Lasanta, et al., 2006). Nevertheless, we must remember that we are talking here about the behaviour of natural processes in an environment that has been altered by man. Plant regeneration, a process which benefits from the presence of terraces, constitutes the first phase of their disappearance, which can result in a gradual rebalance towards the original incline of the slope (Morales & Marco 1995). In any case, the disappearance of these agricultural structures and the homogenisation of the landscape lead to the loss of diversity as regards both the environment and cultural heritage.

## **3. Case study: the region of Valencia**

The Region of Valencia, one of Spain's autonomous communities, is characterised by the presence of two large mountain systems (the Iberian and Betic systems) which lie on top of rich alluvial plains, dating from the Quaternary Period, along the

east coast of the Iberian Peninsula. The region is therefore an area of contrasts, where the mountains, which are all relatively close to the sea, have played a major role in both economic and social terms. This is also true in the rest of eastern and southern Spain (Catalonia, Murcia, Andalusia, and the Balearic Islands), where the dry-stone farming culture of the Mediterranean is very evident. These are areas where climatic and lithological conditions, crop type and the time of construction of the terraces lead to a series of common characteristics. However, there is still no map showing a general overview of the agricultural terraces in the Mediterranean region. A recent map produced by Grove and Rackham (2001) does not include, for example, the important terraces found in Valencia and Catalonia, which were built at the same time as those in Majorca, or those in the Alpujarra region of Granada, which have both been studied in more detail. As a result, these highly representative areas have not been studied in any depth in terms of their importance beyond the significance of their dry-stone constructions (walls, cabins, snow wells, steps, shepherds' shelters). In other words, they have not been examined from a wider perspective as part of a larger landscape. In order to do this, it is necessary to study the origins of these terraces, the reasons why they were built and the period in which they were constructed, as well as the time of and reasons for their abandonment, and the subsequent ecological repercussions. In short, we must define the dynamics of these landscapes.

In this respect, it is important to note that research carried out in this field has been limited, primarily as a result of difficulties experienced when trying to establish the precise dates when these farming structures were built. This is due to the fact that the construction techniques used are actually quite timeless. In other words, it is very difficult to know if a terrace was built in the Middle Ages or in the 19th century. As a result, we need to use a series of different techniques which will help to define the evolution processes involved in rural societies (Giménez-Font 2007). The techniques used, which we shall merely list briefly here, are only visible if they are used in conjunction with one another: historical documentation, toponymy (toponyms relating to former land uses, such as livestock farming, in areas which are currently used to grow crops), landscape archaeology, historical cartography, pollen analyses and sedimentological analyses which, when used in conjunction with archaeological material from extensive and intensive research, allow us to confirm our working hypothesis. In this way, we can date different terrace systems. The first references to such systems date from the Bronze Age (Asins-Velis 2006). Based on research carried out already, we can define two major general phases in the construction of agricultural terraces:

1. Different studies or research projects have shown that there are differences between the cultural exploitation and land management practices which existed in Al-Andalus and those used during the Christian conquest in the 13th century. In terms of farming terraces, in Moorish times irrigated terraces with distinct characteristics were built next to rivers and springs. After the creation of the new Christian kingdom in the

13th century, commercial crop farming was gradually developed, and unirrigated land expanded to cover areas which were previously used for livestock farming or forests. This expansion, which took place in mountain areas, was carried out by constructing terraces. However, the Moors, or the *moriscos*, continued to live in the mountains in the Region of Valencia, and other mountains in southern Spain, until 1609, when they were driven out. This large population was marginalised and driven out of the most fertile areas, and continued to manage the land by using small-scale irrigation methods (Torró, 2005). After the Moors were driven out, these areas were repopulated, leading to periods of extreme demographic pressure which meant that crops were grown at the top of mountains during the 18<sup>th</sup> and 19<sup>th</sup> centuries.

2. As a result, many of the terraces in the Region of Valencia were built relatively recently. The time of their construction may be linked to periods of extreme demographic pressure (such as that which started in the 18<sup>th</sup> and 19<sup>th</sup> centuries), the increase in certain crops (such as vines), aspects relating to land ownership, topographical reasons (steep slopes) and lithological reasons (erodible materials – marls or clays – in areas of chalk or silica which allow stone quarrying), all of which may force mountain settlers to employ these farming techniques. The golden age of crop terraces was the 19<sup>th</sup> century, and from this century onwards they developed very quickly (Olarieta et al. 2006). When agriculture began to be abandoned and the rural exodus started in the second half of the 19<sup>th</sup> century, the possibilities of conserving these terraces became very limited as a result of the economic changes which took place in rural areas in one of the most important areas of the Mediterranean in terms of tourism. Tourism is, in fact, the main economic driving force in the Region of Valencia. Over the last two decades, the region has undergone considerable economic growth as a result of the construction of tourist accommodation. The impact of this construction on the landscape has been of great significance. While this economic boom has taken place, the agricultural terraces have been largely abandoned, and, in most cases, this has had a great impact on the landscape.

#### **4. Opportunities for protection and conservation**

The European agricultural model is gradually placing increasing emphasis on the value of agricultural landscape in terms of a series of environmental factors (habitats, biodiversity) and scenic elements, and the new farming practices that have emerged as a result form what is now known as post-productivist agriculture (Wilson 2004). One part of this new philosophy is the series of EU projects on dry-stone heritage, which have been developed gradually, with varying degrees of success, since 1996. These projects have focused on two main aims: the rehabilitation of terraces and the prevention of natural risks (TERRISC project) and, in particular, strategies of economic reactivation related to the cultural importance of dry-stone construction methods in rural areas (REPS, MEDSTONE, PROTERRA, PATER, REPPIS, *Parcours de*

*Pierres, REVPAR-MEDOC, Carrefour européen du patrimoine de la pierre sèche*). In most of these projects, the Regional government of the Balearic Islands makes a huge contribution, whilst other Spanish regions, such as Catalonia and the Region of Valencia, fail to contribute.

The decline of these landscapes is related to the abandonment of agriculture and the new economic dynamics which have emerged in rural areas. The solutions that can be proposed for the protection and conservation of structures which have lost their original purpose are highly complex. In addition to the projects mentioned above, the EU has subsidised reforestation projects to increase forested areas and prevent erosion processes which occur due to changes in land use. However, these projects have had little success. The real opportunities lie in the increased value of the rural landscape due to environmental factors and the cultural diversity of rural areas. Projects of this type include the recent land use policies approved in Spain, especially the Law on Land Use and Protection of the Landscape approved by the Regional Valencian Government (GV, 2004). However, the terraced landscape needs to be examined at a regional scale and with a view to its protection in the medium term. To do this, a good general analysis of the terraces must be carried out beforehand, and this analysis must include areas such as the Valencian terraces, which have been left out of programmes promoted by the EU to create inventories and catalogues of terraced areas. Agricultural terraces form a landscape characterised by its dynamism but also by its uniqueness, and this means that indicators and methodologies for practical use by land management teams must still be developed.

The recent European projects - ELISA (*European Union Concerted Action on Environmental Indicators for Sustainable Agriculture*), EUROSTAT (*Statistical Office of the European Communities*), PAIS (*Proposal on Agri-Environmental Indicators*) and IRENA (*Indicator Reporting on the Integration of Environmental Concerns into Agricultural Policy*) (Asins-Velis 2006b, 2007) refer, both directly and indirectly, to the importance of traditional farming methods which take advantage of the terracing technique and constitute highly efficient systems for soil conservation and the use of water resources (Blanchemanche 1990; Reparaz 1990). These practices are starting to be recognised and examined as a whole at an international level as part of the *Traditional Knowledge World Bank* programme, which is sponsored by UNESCO.

## 5. Final conclusions

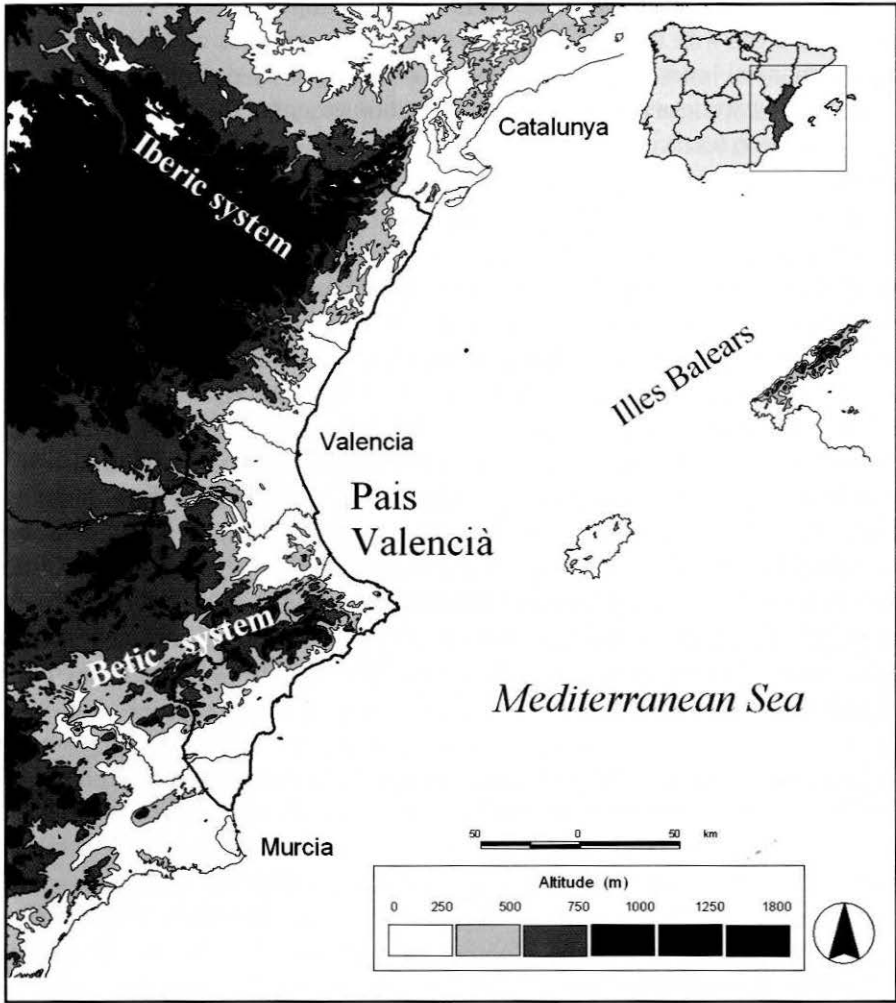
Gradually, more and more studies are being carried out so as to enable the evaluation of the environmental and cultural importance of crop terrace landscapes, although these studies may refer to a number of different scattered areas. In order to devise suitable management tools, we need a global overview of terraced landscapes which goes beyond the local level. However, in areas such as the Region of Valencia, an inventory and catalogue of crop terraces has still not been created. Although they



have acceptable results, most of the European studies carried out in this field have concentrated on one-off areas, and thus other terraced areas still need to be examined in some detail. The problems encountered in attempts to conserve these farming structures in areas with hardly any farmers are highly complex and cannot be solved simply by financial investment. This process must begin by completing the arduous task of raising awareness and increasing motivation amongst the local population that lives near the crop terraces.

The EU has opted to conserve these terraces by emphasising their importance in terms of cultural heritage and the environment. It is aware that the farming activities that originally created the terraces must be continued in order to conserve these anti-erosive structures, which promote biodiversity and help prevent the spreading of forest fires. However, inherent in this type of conservation project is the complex problem of maintaining the rural population and, in particular, traditional agriculture. Not everything can be protected using the tools available today, and it is not necessarily appropriate to declare everywhere to be a "protected area". The terraced landscape can be understood to be part of a process of change, construction and also of disadaptation, constructed to meet a series of economic needs which were defined in a particular moment in history. In order to protect these landscapes, we must provide a comprehensive overview of the crop terrace landscape, an analysis of the options they provide as a resource for tourism and the environmental risks posed by their disappearance, as well as valid solutions which can be applied in the reality of rural areas in southern Spain. This represents a challenge for the scientific community, the political world and for society in general.

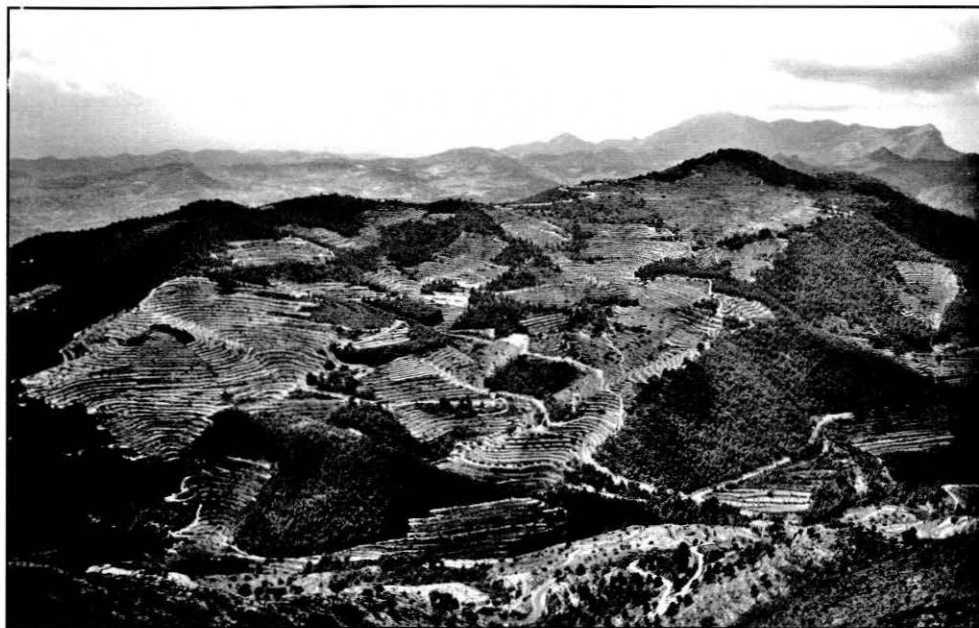
**Figure 1. Area studied**



**Figure 2. Terraces in marginal areas in Aín (Serra d'Espadà, Iberic system). Remains of the old fig and carob trees which have been grown here can still be seen**



**Figure 3. Terrace system in Serra d'Aitana (Betic system)**



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